BEET (*Beta vulgaris*)
WILD BEET (*Beta vulgaris* spp. *maritima*)
Cercospora Leaf Spot; *Cercospora beticola*

Panella, L. and L. E. Hanson
USDA-ARS, Sugarbeet Research Unit
Crops Research Lab
1701 Centre Ave.; Fort Collins, CO 80526-2083

BETA PIs FROM THE USDA-ARS NPGS EVALUATED FOR RESISTANCE TO CERCOSPORA LEAF SPOT, 2000: Twenty-three Plant Introductions (PIs) from the USDA-ARS National Plant Germplasm System (NPGS) (Garden Beet, Sugar Beet, Leaf Beet, Fodder Beet, and wild beet) were evaluated in an artificially produced epiphytotic (Ruppel, E.G., and J.O. Gaskill. 1971. Techniques for evaluating sugarbeet for resistance to *Cercospora beticola* in the field. J. Am. Soc. Sugar Beet Technol. 16:384-389) in Windsor, CO. Randomized complete-block designs, with two replications were used to evaluate germplasm. Internal controls included a highly susceptible synthetic check, SP351069-0, and a resistant hybrid check, (FC504 X FC502/2) X SP6322-0. Two-row plots 4 m long, with 56 cm between rows and 20 to 25 cm within-row spacing, were planted on 27 Apr. The nursery was inoculated twice, on 6 Jul and 13 Jul. Visual evaluations on the plot with a disease index (DI) on a scale from 0 (no disease) to 10 (plant dead) in Windsor were made on 31 Aug, 7, and 14 Sep, with the peak of the epidemic occurring on or about the last date. The field was sprayed twice with Betamix Progress, Upbeet, and Stinger (2 and 12 Jun) to control weeds. The field was thinned by hand and irrigated as necessary.

The high temperatures in the summer of 2000, combined with very low moisture, made it difficult to keep the humidity in the nursery high, and contributed to a mild leaf spot epidemic. The *Cercospora* epidemic was slow to develop and had not become severe enough to rate until the end of August. Disease severity had started to increase by mid September, and our next rating was expected to be more severe. However, heavy rain shortly before our fourth rating prevented entry into the field, and this was followed by snow and frost that damaged leaves so that consistent ratings could not be made after September 24. At our third evaluation, means of the resistant and susceptible internal control were 2.4 and 3.8 (scale of 0-10), respectively, across the nursery. In 1999 (September 14), these means were 3.1 and 6.4, respectively. Means of contributor lines ranged from 1.7 to 6.0. An analysis of variance (PROC ANOVA - SAS) on the disease indices (visual evaluation scores) determined that there were significant differences among entries (P=0.05) on all three dates of evaluation. A number of accessions were not significantly different from the resistant control. These data, and more information on the accessions evaluated, are available through the USDA-ARS GRIN database at http://www.ars-grin.gov/npgs. We would like to thank Dr. Earl Ruppel (USDA-ARS, retired), who helped evaluate the nursery this year.

		Identification		Disease Index[1]		
Entry	**Donor's ID**	**subsp.**	**Origin**	**31 Aug**	**7 Sep**	**14 Sep**
Ames 19166	Ramoskaja 931		Russian Federation	5.3	4.8	4.5
Ames 19167	Jaltuskovaskaja Odnosemiannaja		Russian Federation	4.3	3.8	3.5
PI 116808	Palag		India	5.3	5.0	5.0
PI 164172	Palak		India	5.0	4.3	6.0
PI 198431	WB 171		Italy	3.3	3.5	5.0
PI 476322	Belocerkovskaja odnosemennaja 34		Former Soviet Union	4.0	4.5	5.5
PI 531254	Kawemaja	*vulgaris*	Germany	5.0	4.0	4.5
PI 612767	AT3986A	*vulgaris*	USA	3.3	3.0	3.0
PI 608798	A77-50	*vulgaris*	Chile	3.5	3.3	3.5
PI 608799	A78-30	*maritima*	USA	4.5	3.5	3.8
PI 608803	A80-17	*vulgaris*	Chile	4.3	4.0	4.0
PI 608804	0405	*vulgaris*	USA	3.8	4.0	4.0
PI 612766	AT3985A	*vulgaris*	USA	4.0	4.0	4.0
NSL 141994	043	*vulgaris*	USA	3.8	3.0	3.5
NSL 141995	1502HO/NB1 (CMS)	*vulgaris*	USA	3.5	3.0	4.0
PI 504185	Wild Beet	*maritima*	Italy	4.8	3.8	6.0
PI 504205	Wild Beet	*maritima*	Italy	3.8	2.3	4.0
PI 504262	Wild Beet	*maritima*	Italy	4.0	3.5	4.8
PI 518306	IDBBNR 5800	*maritima*	United Kingdom	1.8	2.0	3.5
PI 540676	WB 930	*maritima*	Denmark	3.0	3.0	2.3
PI 546396	IDBBNR 5595	*maritima*	Turkey	6.0	4.3	4.5
PI 546413	IDBBNR 5639	*maritima*	France	2.8	2.3	4.0
PI 546422	IDBBNR 5640	*cicla*	Greece	3.0	2.5	3.5
PI 257280	IDBBNR 5561	*cicla*	Spain	4.0	3.5	3.5
Leaf Spot Synthetic Susceptible Check[2] (931002)				**3.5**	**3.3**	**3.8**
Leaf Spot Resistant Check[3] (821051H2)				**1.5**	**1.5**	**2.5**
			$LSD_{0.05}$	**2.01**	**1.21**	**1.70**
Trial Mean				**3.9**	**3.4**	**4.1**

[1]Disease Index is based on a scale of 0 (=healthy) to 10 (=dead).
[2]The Leafspot Susceptible Check is SP351069-0.
[3]The Leafspot Resistant Check is ((FC504CMS x FC502/2) x SP6322-0).